

The Claims

What is claimed is:

1. A process for stabilizing a coffee aroma-providing component against loss or degradation of desirable flavor or sensory characteristics of its aroma during storage characterized in that the aroma-providing component is contacted with a stabilizing agent in a manner such that the stabilizing agent is provided in an amount effective to chemically interact with undesirable compounds associated with the aroma-providing component to form a stabilized coffee aroma-providing component which: (a) retains a significant portion of one or more of the desirable flavor or sensory characteristics of the coffee aroma in the coffee aroma-providing component during storage, or (b) reduces off flavor generation during storage of the coffee aroma-providing component, and wherein the stabilized coffee aroma-providing component is essentially free of the stabilizing agent when a food or beverage product containing a coffee aroma from the coffee aroma-providing agent is prepared for consumption.

2. The process of claim 1, characterised in that the stabilizing agent is removed from the stabilized coffee aroma-providing component prior to adding the stabilized coffee aroma-providing component to a food or beverage product.

3. The process of claim 2, characterised in that the stabilizing agent is removed from the stabilized coffee aroma-providing component by distillation, fractionation, precipitation, sublimation, ion-exchange,

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liquid-liquid extraction (organic or aqueous), aqueous liquid-oil extraction, oil-aqueous liquid extraction, chromatographic separation, or stripping.

4. The process of claim 3, characterised in that a column is packed with the stabilizing agent and the coffee aroma-providing agent is passed through the column to stabilize the coffee aroma-providing component.

5. The process of claim 3, characterised in that the coffee aroma-providing agent contacts the stabilizing agent to form a mixture, the mixture is passed through a stripping column, optionally under vacuum, and the stabilized coffee aroma-providing component is collected in a form where it is free of the stabilizing agent.

6. The process of claim 3, characterised in that the aroma-providing agent contacts the stabilizing agent to form a mixture, the mixture is passed through a liquid-liquid extraction column using coffee oil or another oil solvent as an extraction medium, and the stabilized aroma-providing component is collected in a form where it is free of the stabilizing agent.

7. The process of claim 1, characterised in that the stabilized coffee aroma-providing component is prepared by incorporating the stabilizing agent into a material which is added to the coffee aroma-providing component during storage but which material is separable or removable from the coffee aroma-providing component, or the coffee aroma-providing component is separable from the material, before preparation for consumption of a food or beverage product therefrom.

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8. The process of claim 1, characterised in that the stabilized coffee aroma-providing component is formed by contacting the coffee aroma-providing component with a material that contains the stabilizing agent followed by separating the stabilized coffee aroma-providing component from the material.

9. The process of claim 8, characterised in that the material that contains the stabilizing agent is associated with a container for packaging or storing the coffee aroma-providing component prior to use of the component for preparing a food or beverage product.

10. The process of any preceding claim, characterised in that the coffee aroma-providing component is treated with a stabilizing agent that interacts with compounds associated with the coffee aroma-providing component to improve or preserve the coffee aroma compounds that can improve the desirable flavor and sensory characteristics of the coffee aroma component and to reduce the amount of compounds that are associated with the undesirable characteristics.

11. The process of claim 1, characterised in that the stabilized coffee aroma-providing component is formed by incorporating the stabilizing agent into a material which is added to the coffee aroma-providing component during storage and which further comprises separating the stabilized component from the material when a product for consumption is prepared.

12. The process of claim 1, characterised in that the stabilized coffee aroma-providing component is formed by contacting a material that is processed to form the coffee aroma-providing component with the

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stabilizing agent, followed by separating the stabilized coffee aroma-providing component from the material.

13. The process of claim 12, characterised in that the stabilizing agent is added to coffee beans prior to or during roasting, quenching, cooling, or extracting of the beans to generate or isolate an improved coffee aroma.

14. The process of any preceding claim, characterised in that the stabilizing agent is a compound that contains at least one atom having at least one lone pair of electrons and is present in an amount sufficient to react with some of the undesirable reactive compounds associated with the coffee aroma-providing component to reduce some of the undesirable compounds, or to generate or preserve one or more coffee aroma compounds that contribute to the desirable flavor or sensory characteristics of the coffee aroma or that mask off flavors in the coffee aroma-providing component.

15. The process of claim 14, characterised in that the undesirable reactive compounds contain carbonyl groups and the stabilizing agent complexes such compounds to form adducts that are separable from the coffee aroma, resulting in a reduced level of carbonyls in the stabilized coffee aroma-providing component, or the undesirable compounds generate or comprise free radicals and the stabilizing agent is present in an amount sufficient to reduce generation of or scavenge such free radicals so that the coffee aroma component is stabilized and preserved.

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16. The process of claim 14, characterised in that the stabilizing agent cleaves compounds containing disulfide bonds to generate or regenerate thiols that contribute to the desirable flavor and sensory characteristics of the coffee aroma-providing component.

17. The process of any preceding claim, characterised in that the stabilizing agent is a compound that contains at least one atom of sulfur, nitrogen, oxygen or carbon with at least one lone pair of electrons and is used in an amount of between about 1 and 50,000 ppm.

18. The process of any preceding claim, characterised in that the stabilizing agent is a sulfite or a substance that contains or generates a sulfite, a thiol, an amine, an amino acid, or peptide and is used in an amount of between about 1 and 50,000 ppm.

19. The process of claim 18, characterised in that the stabilizing agent comprises a sulfite, cysteine or glutathione or their salts or materials containing such, or an enzyme present in an amount sufficient to react with carbonyls associated with the coffee aroma-providing component.

20. The process of claim 18, characterised in that the stabilizing agent comprises a sulfite, cysteine or glutathione or their salts or materials containing such and they are present in an amount sufficient to exhibit sufficient reducing power to scavenge free radicals and to preserve sulfur aroma compounds in the coffee aroma-providing component from oxidative degradation.

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21. The process of claim 1, characterised in that the stabilizing agent is associated with another additive that acts as a carrier for the stabilizing agent, wherein the carrier is a solvent, an oil, an emulsion, a flavoring agent, a carbohydrate, a protein, or an antioxidant.

22. The process of any preceding claim, characterised in that the stabilizing agent is present in an amount sufficient to react with some or all of the carbonyl groups present in compounds associated with the coffee aroma to generate or regenerate thiols or to reduce or inhibit degradation of thiols in the coffee aroma, thus retaining the desirable flavor or sensory characteristics of the coffee aroma during at least two months of storage of the coffee aroma.

23. The process of claim 1, characterised in that the stabilized aroma-providing component is a liquid that optionally includes a coffee aroma carrier, or the stabilized coffee aroma-providing component is dried to a powder and is stored until a later time when it is reconstituted for consumption by the addition of a liquid.

24. The process of any preceding claim, characterised in that it further comprises combining the stabilized coffee aroma-providing component with a food-forming or beverage-forming ingredient and a liquid to form a liquid food or beverage product, and drying the liquid product by spray-drying or freeze-drying to obtain a solid material that retains the initial flavor or sensory characteristic of the coffee aroma for a time period of at least two months during storage of the solid material.

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25. A packaged food or beverage product in the form of a package that contains therein a stabilized coffee aroma-providing component having preserved or improved desirable flavor or sensory characteristics and being present in an amount sufficient to provide or impart its flavor or sensory characteristics to the product, characterised in that the coffee aroma-providing component is stabilized with a stabilizing agent that is immobilized in, upon or within the package or upon or within a carrier placed upon or within or forming part of the container such that the stabilizing agent is separable or removable from the coffee aroma-providing component, or the coffee aroma-providing component is separable from the stabilizing agent before preparation for consumption of the food or beverage product, wherein the food or beverage product is essentially free of the stabilizing agent and further wherein the loss or degradation of the desirable flavor or sensory characteristics of the stabilized coffee aroma-providing component are reduced or prevented such that the coffee aroma-providing component retains its desirable flavor or sensory characteristics during an extended periods of storage at room temperatures.

26. The product of claim 25, characterised in that the stabilizing agent is immobilized onto ion-exchange resins and the resins are placed within, attached to or formed as part of the container for the aroma-providing component.

27. The product of claim 25 or 26, characterised in that the stabilizer is immobilized onto or within an insoluble matrix which is contacted with the coffee aroma-providing component and subsequently separated from the stabilized coffee aroma-providing component.

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28. The product of any one of claims 25-27, characterised in that the stabilizing agent is confined in a pouch made of a semi-permeable material that contains the stabilizing agent, and the pouch is placed within, attached to or forms part of the container.

29. The product of claim 28, characterised in that the stabilizing agent is solution that is retained in the pouch and the semi-permeable permeate therethrough so that they are able to bind with the stabilizing agent and become at least partly confined within the pouch rather than in the coffee aroma-providing component.

30. The product of claim 26, characterised in that the coffee aroma providing component has one of the following features: (a) a ratio of acetaldehyde to methanethiol that is 200 or less during storage over several months at room temperature; (b) an acetaldehyde concentration of 30 to 90ppm after stabilization of a coffee aroma providing component that initially contains 150ppm acetaldehyde or more; or (c) an acetaldehyde concentration of 20 to 60ppm after stabilization of a coffee aroma providing component that initially contains 80 to 100ppm acetaldehyde.

31. The product of any of claims 25-30, characterised in that a food or beverage product or a food-forming or beverage-forming ingredient is provided in the package along with the coffee aroma-providing agent.

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32. The product of any of claims 25-31, characterised in that the stabilizing agent is present in an amount sufficient to adduct carbonyls in the coffee aroma, remove or reduce carbonyls from the coffee aroma, or reduce the degradation of thiols in the coffee aroma

33. The product of any of claims 25-32, characterised in that the coffee aroma has an initial concentration of acetaldehyde of between about 40 to 2000 ppm but a concentration of acetaldehyde after stabilization of about 1 to 100 ppm wherein the acetaldehyde concentration is reduced by at least 50% during stabilization.

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AMENDED CLAIMS

[received by the International Bureau on 08 April 2004 (08.04.04);
original claims 1-33 remain unchanged, new claims 34-40]

34. Stabilised coffee aroma-providing components having enhanced and/or preserved flavour or sensory characteristics, characterised in that the ratio of acetaldehyde to methanethiol is less than 200, or at least 30 % of the initial amount of acetaldehyde components are removed, or at least 50 % of the initial methanethiol amount is preserved during the period of storage.
35. The stabilised coffee aroma-providing components according to claim 34, characterised in that the ratio is maintained, and that the initial methanethiol amount is preserved, during storage over several months at room temperature.
36. The stabilised coffee aroma-providing components according to claim 34, characterised in that it is provided in gaseous, liquid, or solid form.
37. The stabilised coffee aroma-providing components according to claim 34, characterised in that it is provided in a liquid form and further spray-dried or freeze-dried.
38. The stabilised coffee aroma-providing components according to claim 34, characterised in that it is incorporated in a matrix of oil, water, or other solvents, provided as an emulsion, encapsulated in edible materials, frozen as a frost, or dried to powder form.
39. A beverage product comprising the stabilised coffee aroma-providing components as defined by claim 34.
40. A coffee beverage comprising the stabilised coffee aroma-providing components as defined by claim 34.

AMENDED SHEET (ARTICLE 19)

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